WHAT IS CLAIMED IS:

1. A process for preparing 1,1,1,3,3,3-hexafluoroisopropanol substantially free of 1,1,1-trifluoroacetone, said process comprising the steps of:

- a) reducing 1,1,1,3,3,3-hexafluoroacetone with hydrogen in the presence of a first hydrogenation catalyst to produce a product mixture comprising 1,1,1,3,3,3-hexafluoroisopropanol and 1,1,1-trifluoroacetone; and
- b) preparing 1,1,1,3,3,3-hexafluoroisopropanol substantially free of 1,1,1trifluoroacetone by subjecting the product mixture to a purification process
 comprising at least one purification step selected from the group consisting
 of:
 - i) subjecting the product mixture to a further reducing with hydrogen in the presence of a second hydrogenation catalyst to yield a reduced product mixture, and separating 1,1,1,3,3,3-hexafluoroisopropanol substantially free of 1,1,1-trifluoroacetone from said reduced product mixture by fractional distillation;
 - ii) cooling the product mixture to a temperature at which the 1,1,1,3,3,3-hexafluoroisopropanol freezes and the 1,1,1-

trifluoroacetone remains liquid;

subjecting the product mixture, which, for the purposes of this purification step, further comprises a high boiling complex comprising hydrofluoric acid and 1,1,1-trifluoroacetone, to fractional distillation, and separating 1,1,1,3,3,3-hexafluoroisopropanol substantially free of 1,1,1-trifluoroacetone from said high boiling complex by fractional distillation; and

iv) subjecting the product mixture to hydrofluoric acid-free conditions wherein 1,1,1,3,3,3-hexafluoroisopropanol forms a high boiling azeotrope with 1,1,1-trifluoroacetone, and separating 1,1,1,3,3,3-hexafluoroisopropanol substantially free of 1,1,1-trifluoroacetone from said high boiling azeotrope by fractional distillation.

- 2. The process according to claim 1, wherein the first hydrogenation catalyst is a palladium on carbon catalyst.
- 3. The process according to claim 2, wherein the palladium on carbon catalyst is a 2% palladium on carbon catalyst.
 - 4. The process according to claim 1, wherein the product mixture is subjected to a

purification process comprising subjecting the product mixture to a further reducing with hydrogen in the presence of a second hydrogenation catalyst to yield a reduced product mixture, and separating 1,1,1,3,3,3-hexafluoroisopropanol substantially free of 1,1,1-trifluoroacetone from said reduced product mixture by fractional distillation.

- 5. The process according to claim 4, wherein the second hydrogenation catalyst is a palladium on carbon catalyst.
- 6. The process according to claim 5, wherein the palladium on carbon catalyst is a 2% palladium on carbon catalyst.
- 7. The process according to claim 1, wherein the product mixture is subjected to a purification process comprising cooling the product mixture to a temperature at which the 1,1,1,3,3,3-hexafluoroisopropanol freezes and the 1,1,1-trifluoroacetone remains liquid.
- 8. The process according to claim 7, wherein the product mixture is cooled to a temperature between about -4°C and about -78°C.
- 9. The process according to claim 1, wherein the product mixture is subjected to a purification process comprising subjecting a product mixture further comprising a high boiling complex comprising hydrofluoric acid and 1,1,1-trifluoroacetone to fractional distillation, and separating 1,1,1,3,3,3-hexafluoroisopropanol substantially free of 1,1,1-trifluoroacetone from

said high boiling complex by fractional distillation.

- 10. The process according to claim 9, which comprises adding hydrofluoric acid to the product mixture in a ratio of hydrofluoric acid:product mixture of from about 1:99 to about 1:19.
- 11. The process according to claim 9, wherein hydrofluoric acid is introduced along with the reactants or separately added to reduction step (a).
- 12. The process according to claim 1, wherein the product mixture is subjected to a purification process comprising subjecting the product mixture to hydrofluoric acid-free conditions wherein 1,1,1,3,3,3-hexafluoroisopropanol forms a high boiling azeotrope with 1,1,1-trifluoroacetone, and separating 1,1,1,3,3,3-hexafluoroisopropanol substantially free of 1,1,1-trifluoroacetone from said high boiling azeotrope by fractional distillation.
- 13. The process according to claim 12, wherein the hydrofluoric acid-free conditions are established by subjecting the product mixture to filtration through silica or potassium fluoride.
- 14. A process for separating 1,1,1,3,3,3-hexafluoroisopropanol substantially free of 1,1,1-trifluoroacetone from a mixture comprising 1,1,1,3,3,3-hexafluoroisopropanol and 1,1,1-trifluoroacetone, said process comprising the steps of:

a) providing a mixture comprising 1,1,1,3,3,3-hexafluoroisopropanol and
 1,1,1-trifluoroacetone; and

- b) preparing 1,1,1,3,3,3-hexafluoroisopropanol substantially free of 1,1,1trifluoroacetone by subjecting the mixture to a purification process
 comprising at least one purification step selected from the group consisting
 of:
 - i) subjecting the mixture to a reducing with hydrogen in the presence of a hydrogenation catalyst to yield a reduced mixture, and separating 1,1,1,3,3,3-hexafluoroisopropanol substantially free of 1,1,1-trifluoroacetone from said reduced mixture by fractional distillation;
 - ii) cooling the mixture to a temperature at which the 1,1,1,3,3,3-hexafluoroisopropanol freezes and the 1,1,1-trifluoroacetone remains liquid;
 - subjecting the mixture, which, for the purposes of this purification step, further comprises a high boiling complex comprising hydrofluoric acid and 1,1,1-trifluoroacetone, to fractional

distillation, and separating 1,1,1,3,3,3-hexafluoroisopropanol substantially free of 1,1,1-trifluoroacetone from said high boiling complex by fractional distillation; and

- iv) subjecting the mixture to hydrofluoric acid-free conditions wherein 1,1,1,3,3,3-hexafluoroisopropanol forms a high boiling azeotrope with 1,1,1-trifluoroacetone, and separating 1,1,1,3,3,3-hexafluoroisopropanol substantially free of 1,1,1-trifluoroacetone from said high boiling azeotrope by fractional distillation.
- 15. The process according to claim 14, wherein the mixture is subjected to a purification process comprising subjecting the mixture to a reducing with hydrogen in the presence of a hydrogenation catalyst to yield a reduced mixture, and separating 1,1,1,3,3,3-hexafluoroisopropanol substantially free of 1,1,1-trifluoroacetone from said reduced mixture by fractional distillation.
- 16. The process according to claim 15, wherein the hydrogenation catalyst is a palladium on carbon catalyst.
- 17. The process according to claim 16, wherein the palladium on carbon catalyst is a 2% palladium on carbon catalyst.

18. The process according to claim 14, wherein the mixture is subjected to a purification process comprising cooling the mixture to a temperature at which the 1,1,1,3,3,3-hexafluoroisopropanol freezes and the 1,1,1-trifluoroacetone remains liquid.

- 19. The process according to claim 18, wherein the mixture is cooled to a temperature between about -4°C and about -78°C.
- 20. The process according to claim 14, wherein the mixture is subjected to a purification process comprising subjecting a mixture further comprising a high boiling complex comprising hydrofluoric acid and 1,1,1-trifluoroacetone to fractional distillation, and separating 1,1,1,3,3,3-hexafluoroisopropanol substantially free of 1,1,1-trifluoroacetone from said high boiling complex by fractional distillation.
- 21. The process according to claim 20, which comprises adding hydrofluoric acid to the mixture in a ratio of hydrofluoric acid:mixture of from about 1:99 to about 1:19.
- 22. The process according to claim 20, wherein the mixture already comprises hydrofluoric acid.
- 23. The process according to claim 14, wherein the mixture is subjected to a purification process comprising subjecting the mixture to hydrofluoric acid-free conditions wherein 1,1,1,3,3,3-hexafluoroisopropanol forms a high boiling azeotrope with 1,1,1-

trifluoroacetone, and separating 1,1,1,3,3,3-hexafluoroisopropanol substantially free of 1,1,1-trifluoroacetone from said high boiling azeotrope by fractional distillation.

24. The process according to claim 23, wherein the hydrofluoric acid-free conditions are established by subjecting the mixture to filtration through silica or potassium fluoride.

,